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AUTHOR Pye, Clifton
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ABSTRACT

K'iche' Maya divides the breaking and cutting domains into much more specific actions than either English or Spanish. K'iche' does not have a general word for breaking that can be substituted for the specialized breaking verbs in the way that English "break" can be used to describe more specific senses of picking, popping, smashing, or shattering. Twenty-seven definitions for English "break" are listed versus 42 meanings in K'iche'. Thus, K'iche' has gaps in its lexical and conceptual structure with no equivalent lexical or phrasal expressions for English "break" and "cut." K'iche' examples illustrate that "cut" verbs do not universally fail to undergo the causative alternation. Such facts pose severe difficulties for the notion of a universal conceptual structure underlying language. It is concluded that K'iche' breaking verbs are difficult to define because their meaning is not captured by the same set of semantic features that underlies English breaking verbs. It is concluded that the assumption of semantic indeterminacy expands the scope of field investigations and is preferable to the assumption of semantic determinacy. (Contains 16 references.) (Author/NAV)

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K'ICHE' MAYA VERBS OF BREAKING AND CUTTING

Clifton Pye
University of Kansas

Abstract: K'iche' Maya divides the breaking and cutting domains into much more specific actions than English or Spanish, e.g., -pi'i:j 'break something soft', -joyopi:j 'break off a banana'. K'iche' does not have a general word for breaking that can be substituted for the specialized breaking verbs in the way that English 'break' can be used to describe more specific senses of picking, popping, smashing or shattering. Thus, K'iche' has gaps in its lexical and conceptual structure with no equivalent lexical or phrasal expressions for English 'break' and 'cut'. Such facts pose severe difficulties for the notion of a universal conceptual structure underlying language.

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A number of Mayanists have commented on the relative abundance of Mayan verbs in different domains (Berlin 1967, Brody 1978, Furbee 1974, Haviland 1992, Norman 1973). A conflation of positional and manner adverbial information in the semantic representations of verbs seems to drive lexical proliferation in the Mayan languages. I first encountered the problem of Mayan verb abundance when transcribing K'iche' Maya breaking and cutting verbs. I remember quite vividly my bafflement over the profusion of breaking verbs K'iche' toddlers were using in my recordings. They used at least four different verbs (*-etzalob'*, *-pax*, *-pi'* and *-q'upi*) to label breaking events. Since my research focus was on inflectional morphology at the time, I postponed further investigation of K'iche' verb semantics. I finessed this puzzle by the simple expedient of translating all of these verbs as 'break' and hoped that context would provide enough information for me to work out the more subtle distinctions later.

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Years later I stumbled onto the same phenomenon in my introductory linguistics class. Knowing that K'iche' had a variety of breaking verbs I polled my students on breaking verbs in their languages. I was surprised to find that my naive question (How do you say 'break' in your language?) produced only one or two verbs in each language. When I talked to several students afterwards, I discovered that they did, indeed, have more breaking verbs. They just volunteered the first verb that came to mind when I asked for a translation. I have since developed a more refined approach to eliciting breaking and cutting verbs through illustration and example.

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These experiences acquired some urgency for me through a reading of Quine's work on the inscrutability of reference (1960). Quine uses translation as one of his key arguments against determinant semantic theories. A determinant semantics would provide a fixed set of universal concepts for semantic interpretation. Languages could then choose how to lexicalize these concepts through lexical or phrasal forms or through the conflation of several concepts in a single lexical entry. Quine argues that the concepts expressed by natural languages are indeterminant in that they lack a complete specification. Indeterminacy allows the conceptual change evident in the evolving concepts of everyday artifacts (Petroski 1992) and the natural world (Putnam 1990). One implication of semantic indeterminacy is that translation between languages is only approximate because the concepts underlying words and phrases are incomplete. Translators have no objective algorithm to insure exact translation so they are forced to improvise ways to hint at the broad outline of a word's meaning. I will show that the domain of breaking and cutting verbs is particularly revealing in this regard and supports Quine's position on the inscrutability of reference. Semantic indeterminacy has significant implications for current linguistic theory which I will touch on briefly.

Two years ago I revisited Guatemala to elicit a definitive set of K'iche' breaking and cutting verbs and a more explicit notion of their semantic range. I started with a careful consideration of the range of actions English verbs are typically applied to. Dictionaries generally break lexical entries into a variety of uses or 'senses'. The American Heritage College Dictionary lists twenty-seven transitive senses for *break*:

I. **break**:

1. To cause to separate into pieces suddenly or violently; smash.
2. To divide into pieces, as by bending or cutting: *break crackers*.
3. To snap off or detach.
4.a. To fracture a bone of: *I broke my leg*.
   b. To fracture (a bone).
5. To crack without separating into pieces.
6.a. To destroy the completeness of (a set or collection).
   b. To exchange for smaller monetary units: *break a dollar*.
7. To disrupt the uniformity or continuity of: *a plain broken by low hills*.
8. *Elect*. To open: *break a circuit*.
9.a. To puncture or penetrate: *The blade broke the skin*.
   b. To part or pierce the surface of: *a dolphin breaking water*.
10. To cause to burst.
11. To force one's way out of; escape from; *break jail*.
12.a. To prove false: *They broke my alibi*.

b. To uncover the basic elements and arrangements of: *break a code*.
13. To make known, as news: *break a story*.
14. To surpass or outdo: *broke the record*.
15. To overcome (a force or resistance): *break the sound barrier*.
16. To put an end to: *break a strike*.
17. To lessen in force or effect: *break a fall*.
18. To render useless or inoperative: *We broke the radio*.
19. To weaken or destroy, as in spirit or health.
20. To cause the ruin or failure of (an enterprise, for example).
21. To reduce in rank; demote.
22. To cause to be without money or go into bankruptcy.
23. To fail to fulfill; cancel: *break one's plans*.
24. To fail to conform to; violate: *break the law*.
25. *Law*. To invalidate (a will) by judicial action.
26.a. To give up (a habit).
b. To cause to give up a habit.
27. To train to obey; tame.

Such entries display an untidiness that has prompted a long history of lexicographic dispute, but relatively little attention from linguists (Norvig & Lakoff 1987). The primary issue is the degree to which these entries represent distinct concepts of breaking. The central sense seems to be to cause a fracture. The fracture may result in either complete separation (senses 1-3) or incomplete separation (senses 4, 5 and 7).

Taking these entries as separate senses accounts for their varied meanings, but creates new problems. A separate sense analysis leaves unexplained why English lexicalizes just this set of concepts with the verb *break*. Indeed, the separate sense analysis fails to respond to the central issue for generative linguistics—how speakers extend their words to novel events. The productivity arguments for generative syntax apply with equal force to lexical semantics since speakers must decide how to adjust limited vocabularies to the infinitely varied demands of the real world in exactly the same way they adjust sentence structure to the demands of discourse (Ellis 1993). Since no two objects break in exactly the same way there is no way to specify the semantic range of the English verb *break* in advance.

The separate senses of *break* all describe fractures of one sort or another. The verb *break* does not specify a particular range of breaking actions, objects, instruments or manners. Any entity, real, imagined or unimagined, may be 'broken'. The more metaphorical senses of *break* merely specify the fracture of some abstract entity such as news or a strike. The American Heritage Dictionary includes several synonyms in its definition of

break. These include *separate, smash, divide, bend, cut, snap off, fracture, crack, destroy, exchange, disrupt, open, puncture, penetrate, part, pierce, burst, escape, prove false, uncover, make known, surpass, outdo, overcome, put an end to, lesson, render useless, weaken, destroy, ruin, reduce, demote, bankrupt, cancel, violate, invalidate, give up* and *tame*. As limited as this list is, you can begin to see the galaxy of concepts that enter the range of breaking in English. These synonyms specify more limited ways of breaking things, but the main consideration for now is that English allows its speakers to use the more general verb *break* to label each of these specific events. Smashing, cracking or popping something implies that it is broken.

A semantic determinist could maintain that the English verb *break* simply conflates all of these concepts. Finding that another language lacked the more general term, and used more specific verbs that translate as *smash* or *pierce* would be uninteresting insofar as one could still preserve the determinist set of fixed, universal concepts. A proof of translational indeterminacy requires a demonstration that exact translation is impossible even modulo a Boolean algebra covering more specific concepts.

Obviously, the English verb *break* cannot be defined as the sum total of these concepts. Its senses only partially overlap the senses of each of the proposed constituent senses. The main sense of *separate* allows for reattachment while *break* does not. *Smash* implies complete destruction caused by the disproportionate application of force; *break* does not. *Divide* implies a calculation of proportions; *break* does not. Even this dodge of the semantic determinist will not account for the exact range of senses attributed to *break*.

While *break* is apparently oblivious to a number of possible constraints in its range of application, it does have its own peculiar set of constraints. Thus, *break* is applied freely to one or three dimensional flexible objects like thread and bread, but not to two dimensional, flexible objects like paper or blankets. English lexicalizes this distinction as the difference between the verbs *break* and *tear*. English speakers are sensitive to this difference and insist that breaking and tearing are distinct 'concepts'. Likewise *break* is insensitive to a range of instruments used in the action such as hands, feet, teeth, sticks, clubs or bricks. However, the use of edged instruments triggers another semantic constraint—the use of the verb *cut*. A complete semantic theory needs to explain why English speakers believe that a popping or cracking event implies that something broke, whereas tearing or cutting something does not.

With these preliminaries out of the way, I can now introduce the K'iche' verbs of breaking and cutting. These verbs are listed in (II). I provide two forms for each verb. The first is transitive and the second intransitive.

Each is followed by an English translation and representative objects the verb applies to. My translations are at best suggestive of the range of objects the verbs apply to, and I caution readers to avoid the temptation to treat them as complete translations. Going through this list it is possible to pick out several K'iche' verbs that are similar to subsenses of *break* in English. The verb *-etzalob'a:j* (7. to break down; ruin) is close to sense 18 of *break*—to render useless or inoperative. The verb *-poq'i:j* (26. to pop; to explode) is close to sense 10 of *break*—to cause to burst. Other K'iche' verbs lack a simple translation into English, e.g., verb 1 *-chiko:j* (to break by throwing the object itself), verb 3 *-ch'akati:j* (to break off a small piece) and verb 22 *-paxi:j* (to break clay, rock). I especially like verbs 14 *-joyopi:j* (to break a banana from a bunch of bananas) and 11. *-jochopi:j* (to break a banana by failing to support the whole bunch).

II. K'iche' Breaking and Cutting Verbs

1. -chiko:j/-chikoxik [to break by throwing the object itself, e.g. chest, stool, pot]
2. -chup/-chupik [to snuff out something, e.g. candle, light; to erase marks]
3. -ch'akati:j/-ch'akatixik [to break off a small piece, e.g. bread to feed hens]
4. -ch'ol/-ch'o:lik [to peel, e.g. fruit, vegetables, animals, skin]
5. -ch'up/-ch'upik [to pick large fruit, e.g. peaches, pineapples, melons]
6. -b'oq/-b'oqik [to pick a plant from the ground, roots and all, e.g. onions]
7. -etzalob'a:j/-etzalob'ik [to break down; ruin, e.g. computer, car, zipper]
8. -jach'/-jach'ik [to pick corn, e.g. the cob, the ear, the kernels, the husk]
9. -jisi:j/-jisinik [to crack, slit, e.g. glass, paper; to operate on someone]
10. -jixi:j/-jixinik [to tear leaves along the veins]
11. -jochopi:j/-jochopinik [to break a banana by failing to support the whole bunch]
12. -jok'/-jok'ik [to grind, e.g. lime, rice, wheat]
13. -jol/-jolik [to pull entire leaf and part of stem from corn in a downward motion]
14. -joyopi:j/-joyopinik [to break a banana from a bunch of bananas]
15. -kabiq/-kabiqik [to shell corn by twisting the cob in one's hands]
16. -ke'e:j/-ke'exik [to grind corn]

17. -k'et/k'etik [to shell corn with one's thumb—imitating a hen pecking corn]
18. -mak/-makik [to pick small beans, e.g. coffee, beans]
19. -mich'/-mich'ik [to chop, e.g. plants; to pluck, e.g. feathers, pine needles]
20. -pachale:j/-pachalexik [to smash something with one's foot]
21. -paq'i:j/-paq'inik [to split, e.g. boards, watermelon, balloon]
22. -paxi:j/-paxik [to break clay, rock, e.g. glass, plate, cup, rock, pot]
23. -pitz'itz'e:j/-pitz'itz'exik [to crush something soft, e.g. clay]
24. -pi'i:j/-pi'inik [to break something soft, e.g. book, tortilla, clay, hardboiled egg; to split or break hair, plate; to divide, e.g. road]
25. -pich'i:j/-pich'inik [to squash bugs, e.g. lice, fleas, worms]
26. -poq'i:j/-poq'ik [to pop, e.g. bubble, balloon; to explode, e.g. bomb]
27. -qasa:j/-qajik [to descend; to break in a downward fashion, e.g. arm, leg, stick, tree]
28. -qopi:j/-qopinik [to cut in an unspecified manner]
29. -q'at/-q'aatik [to cut carefully]
30. -q'ipi:j/-q'ipinik [to chip; to make smaller, e.g. mug, roll up pants legs, break sticks across one's knee for kindling]
31. -q'ol/-q'olik [to pick leaves by tearing across the base of the leaf, e.g. picking flowers, leaves to wrap tamales and tortillas]
32. -q'upi:j/-q'upinik [to break something hard, e.g. bridge, dam, candle, basket, stick, chair, tooth]
33. -rach'aqi:j/-rach'aqinik [to tear, e.g. pants, cloth, paper]
34. -raqi:j/-raqinik [to smash something hollow, e.g. glass, pot, plate, chest, bubble]
35. -sak'i:j/-sak'inik [to crack, e.g. wall, melon, pot, plate, glass, skull, tree, board]
36. -t'oqopi:j/-t'oqopinik [to sever something long and flexible, e.g. rope, wire, string; to pluck hair]
37. -t'ub'i:j/-t'ub'inik [to tear, e.g. paper, clothes]
38. -weqi:j/-weqinik [to smash something hard, e.g. pot, wall, stone griddle, mile post]
39. -woqi:j/-woqinik [to shatter something fragile, e.g. eggs, vase, light bulb]
40. -xul/-xulik [to pick something by the stem, e.g. grapes]
41. -yoji:j/-yojinik [to dismantle something, e.g. table, bed, house, car]
42. -yokoke:j/-yokokenik [to crumple something, e.g. aluminum cans, paper cups]

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K'iche' speakers are adamant about making the appropriate distinctions with each verb. The idea of interchanging verb 24 *-pi'i:j* (to break something soft) with verb 34 *-t'oqopi:j* (to sever something long and flexible), or 37 *-woqi:j* (to shatter something fragile) is as inconceivable for K'iche' speakers as the idea of interchanging *break* and *cut* is for English speakers. The ordinary K'iche' speaker assumes these verbs distinguish different concepts, and that a *pi'i:j* event does not imply a *t'oqopi:j* event.

My list raises several issues which I will not be able to address in this paper. One issue I will address is the number of different domains that I included in the K'iche' list. The set of 'picking' verbs are probably the most noticeable, but note that I have also included tearing, smashing and destruction verbs. Being an agricultural society, the K'iche' have developed a harvesting lexicon that rivals that of a Kansas farmer. Particularly noteworthy in this regard are verbs 10 *-jixi:j* (to tear leaves along the veins), 13 *-jol* (to pull entire leaf and part of stem from corn in a downward motion), and 29 *-q'ol* (to pick leaves by tearing across the base of the leaf). I include the 'pick' verbs because picking implies breaking, but adds purpose information to the event. Purposes range beyond the purely physical nature of the event, and I wanted to avoid making any assumptions about nonobjective features of the events in my initial study. The K'iche' 'banana' breaking verbs (14 *-joyopi:j* and 11. *-jochopi:j*) demonstrate how difficult it may be to establish an objective divide between the picking and breaking domains.

Restricting the discussion to the primary breaking and cutting K'iche' verbs still leaves much to account for. There are at least three verbs for breaking hard things (22. *-paxi:j* [to break clay, rock, e.g. glass, plate, cup, rock, pot], 32. *-q'upi:j* [to break something hard, e.g. bridge, dam, candle, basket, stick, chair, tooth] and 38. *-weqi:j* [to smash something hard, e.g. pot, wall, stone griddle, mile post]) as well as two verbs for breaking soft things (23. *-pitz'itz'e:j* [to crush something soft, e.g. clay] and 24. *-pi'i:j* [to break something soft, e.g. book, tortilla, clay, hardboiled egg; to split or break hair, plate; to divide, e.g. road]). I am unable to distinguish these verbs more precisely and therefore I cannot predict which of the breaking verbs would apply to such novel substances as plastic or jello. The K'iche' speakers that I worked with on this project also had trouble distinguishing between peripheral uses of these verbs although they could distinguish certain prototypical uses that were different in each case.

These verbs are not used interchangeably like the verbs *rip* and *tear* in English. In fact K'iche' has a similar set of tearing verbs (33. *-rach'aqi:j* [to tear, e.g. pants, cloth, paper] and 37. *-t'ub'i:j* [to tear, e.g. paper, clothes]). K'iche' speakers readily acknowledge that these verbs are synonymous and can

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be used interchangeably. So their intuitions about differences between the verbs for breaking hard and soft objects are real and imply that these verbs refer to distinct concepts. Furthermore, the events these verbs range over are constrained by the meanings of other verbs. For example, I would have predicted that crushing bugs would be a *q'upi:j* (verb 32) type of event considering how hard it is to squash a Guatemalan flea, but K'iche' speakers use verb 25. *-pich'i:j* for this action.

My conclusion from this line of reasoning is that K'iche' breaking verbs are difficult to define because their meaning is not captured by the same set of semantic features that underlies English breaking verbs. The difficult K'iche' breaking verbs do not correspond neatly to many subsenses of the English verb *break*. A verb like *q'upi:j* can be defined in English as a type of breaking event, but only by assuming the English break concept constitutes a neutral frame of reference. One can just as arbitrarily establish a *q'upi:j* frame of reference and define the English verb *break* as a complexive concept, arbitrarily ranging over parts of the *q'upi:j*, *pi'i:j*, *poq'i:j*, *raqi:j*, and *t'oqopi:j* domains. We have no theoretical warrant for assuming that *break* or any of its subsenses constitute universal concepts that are readily available to the language learner. In fact, there is acquisition data that shows such concepts are difficult to learn (Bowerman 1978; Pye, Loeb & Pao 1995). Quine's theory of semantic indeterminacy and the inscrutability of reference offer the best account of these observations.

Semantic indeterminacy has important consequences for theoretical and descriptive linguistics. It should be apparent that simple translations of verbs as 'break' will not document the range of events these verbs describe. It is necessary to examine the range of objects each verb is used with to begin to understand native speaker intuitions about verb meaning. We must guard against the assumption that just because a verb in another language has a use that corresponds to the typical use of an English verb that we have found a good translation in English. The assumption of semantic indeterminacy expands the scope of field investigations, and is thus preferable to the assumption of semantic determinacy.

For theoretical linguistics, the most important consequence of semantic indeterminacy may be the loss of a universal conceptual framework that would anchor syntax-semantics mapping rules. One area where these observations are applicable is the research on verb argument structure (Grimshaw 1990, Levin & Rappaport 1995). Much of this work assumes there is some uniformity between verb meaning and verb argument structure. The verbs *break* and *cut* play a prominent role in this literature since *break* participates in the causative alternation while *cut* does not (see 3). The usual argument is that *cut* entails an

instrument while *break* does not. One reason behind my research on *break* and *cut* in K'iche' was to determine whether the difference in argument structure holds for K'iche'. Hence, I provide transitive and intransitive forms for each verb.

3. The Causative Alternation in English

a. Ralph broke the stick.
b. The stick broke.
c. Alice cut the paper.
d. *The paper cut.

The K'iche' break verb 32. *-q'upi:j* alternates between transitive and intransitive stems via the absolutive antipassive. This antipassive suffix adds a vowel plus an /n/ to convert a transitive verb stem into an intransitive stem. Normally, the absolutive antipassive retains the agent and leaves the patient unexpressed (see 4).[1] However, the absolutive antipassive functions as an anticausative alternation for a few K'iche' verbs, including *q'upi:j* (see 5). For these verbs, the absolutive antipassive demotes the agent instead of the patient. It happens that the absolutive antipassive also has this effect on the K'iche' cut verb *qopi:j* (as shown in 6). I include one of the K'iche' passive forms in (6) to underscore the point that the absolutive antipassive functions as an anticausative alternation rather than a passive.

4. The Absolutive Antipassive Alternation in K'iche' Maya

a. Transitive
x-Ø-u/tze'-ej le: ak'ala:b' le: a Wan
ASP-3A-3E/laugh-TV the children the FAM John
John laughed at the children.

b. Absolutive Antipassive
x-Ø/tze'-en le: a Wan
ASP-3A-laugh-AA the FAM John
John laughed.

5. a. Transitive
x-Ø-u/q'up-ij le: che' le: a Wan
ASP-3A-3E-break-TV the stick the FAM John
John broke the stick.

b. Absolutive Antipassive
x-Ø/q'up-in le: che'
ASP-3A-break-AA the stick
The stick broke.

6. a. Transitive
x-Ø-u/qop-ij le: wu:j le: al Mari:y
ASP-3A-3E-cut-TV the paper the FAM Mary
Mary cut the paper.

b. Absolutive Antipassive
x-Ø/qop-in le: wu:j
ASP-3A-cut-AA the paper
The paper cut.

c. Passive1
x-Ø/qop-ix le: wu:j
ASP-3A-cut-PASS1 the paper
The paper was cut.

The K'iche' data show that cut verbs do not universally fail to undergo the causative alternation. One possibility is that the K'iche' verb does not mean the same thing as the English verb *cut*. By now, though, it should be evident that we cannot make claims about semantic equivalence given semantic indeterminacy. The K'iche' cut verb is as similar semantically as the K'iche' break verb is to its English translation. Denying translational equivalence for one, denies it for the other and undermines the search for syntax-semantics mapping regularities. I conclude that linguistic theory must be stated in terms of a relativistic semantic framework such as Dowty's (1991).

I have only touched on a few verbs in this paper. It should be evident that similar comments could be made about other verbs as well. The domains of picking, holding, opening and sitting would probably yield similar results. Verb concepts are supposedly more complex than noun concepts because of the many variables that are part of their meaning. Nouns may be recognized through perceptual or functional similarities, although functional similarities are more robust. The trouble is that verbs do the heavy lifting in functional definitions, so indeterminacy for verbs leads to indeterminacy for nouns. Knives may take any form so long as they cut; but cutting is indeterminant so the concept of a knife must be indeterminant as well.

My current research is devoted to understanding the consequences and implications of semantic indeterminacy for linguistic theory and language

acquisition. I am exploring the possibility of merging Quine's prototype semantics with Saussure's ideas of contrast. The basic idea is that speakers generalize an n-dimensional semantic space for each word on the basis of their exposure to the word and its contrast to other words on one or more dimensions of semantic space. Possible dimensions for breaking events include degree of force, direction of force, instrument, type of object, spatial configuration of the object, and the object's material, but semantic indeterminacy allows these dimensions to change at any time. The contrast between *break* and *tear* in English illustrates the way in which words serve to constrain semantic space. The lexicon can exploit some dimensions and thereby expand their semantic space. Mayan languages pay special attention to an object's configuration and position. Semantic space is relatively constrained by the preoccupations of human speakers, but not absolutely. New dimensions may be invented as needed to describe new objects or novel events.

NOTE

[1] I use the following abbreviations: ASP—aspect marker; AA—absolutive antipassive; FAM—familiar reference particle; PASS1—passive 1; TV—derived transitive verb suffix; 3A—third person, singular, absolutive cross-reference marker; 3E—third person, singular, ergative cross-reference marker.

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